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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re patent of:

Inventors: H. GYOTEN, et al.

Patent No.: 7,172,829 Issued: February 6, 2007

Serial No.: 10/681,334 Filed: October 9, 2003

For: FUEL CELL AND PROCESS FOR THE PRODUCTION OF SAME

REQUEST FOR CERTIFICATE OF CORRECTION UNDER RULE 323

The Honorable Commissioner of
Patents and Trademarks
Washington, D.C. 20231

Sir:

It is respectfully requested that a Certificate of Correction be issued in order to correct the error specified in the attached copy of the Certificate of Correction form (PTO-1050).

XX In accordance with the provisions of Rule 323, please charge Deposit Account No. 04-1061 in the amount of One Hundred Dollars ($100.00).

Should any additional fees be required in connection with this Certificate of Correction, they may be charged to Deposit Account 04-1061.

Also attached is a marked-up copy of the page of the patent showing the requested change.

Respectfully submitted,

James E. Ledbetter
Registration No. 28,732

Attachment:
Certificate of Correction form (PTO-1050)

Date: April 14, 2008
JEL/jcw
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(Also Form PTO-1050)

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : **7,172,829**

DATED : **February 6, 2007**

INVENTOR(S) : **Gyoten., et al.**

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Claim 3, second to last line, change "an" to --and--.

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PATENT NO. 7,172,829

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However, the disclosure shows and describes only various embodiments of the invention, but it is to be understood that the invention is capable of use in various other combinations, modifications, and environments. Also, the invention is capable of change or modification, within the scope of the inventive concept, as expressed herein, that is commensurate with the above teachings and the skill or knowledge of one skilled in the relevant art.

The embodiments described herein are further intended to explain best modes known of practicing the invention and to enable others skilled in the art to incorporate the invention in these and other embodiments, with the various modifications that may be required by the particular applications or uses of the invention. Accordingly, the description is not intended to limit the invention to the form disclosed herein.

Advantages of the Invention

As mentioned above, the creep resistance of the entire electrolyte membrane can be enhanced while maintaining the desired hydrogen ionic conductivity. In this arrangement, the mixing of reactive gases on the anode side and cathode side or minute short-circuiting of the two electrodes due to plastic deformation of the electrolyte membrane can be prevented, making it possible to provide a polymer electrolyte membrane type fuel cell which can operate stably over an extended period of time. The embodiments of the present invention are advantageous in that the performance deterioration or destruction of the fuel cell caused by creep or stress relaxation in the electrolyte can be inhibited.

What is claimed is:

1. A fuel cell component comprising:

an electrolyte membrane; and

a plurality of insert members disposed in the electrolyte membrane that provide resistance to creep in the electrolyte membrane that would otherwise result from a compression force applied substantially perpendicular to a surface of said electrolyte membrane, wherein:

the plurality of insert members comprise PTFE and have an average outer dimension that is greater than 5 μm and no greater than a thickness of the electrolyte membrane.

2. A fuel cell component comprising:

an electrolyte membrane; and

a plurality of insert members disposed in the electrolyte membrane that provide resistance to creep in the electrolyte membrane that would otherwise result from a compression force applied substantially perpendicular to a surface of said electrolyte membrane, wherein:

the electrolyte membrane is produced from a polymer electrolyte solution having an EW value in the range of 900 to 1100, and

the EW value of the electrolyte membrane is substantially the same as the EW value of the insert member.

3. A fuel cell component comprising:

an electrolyte membrane; and

a plurality of insert members disposed in the electrolyte membrane that provide resistance to creep in the electrolyte membrane that would otherwise result from a compression force applied substantially perpendicular to a surface of said electrolyte membrane, wherein:

the plurality of insert members comprise PTFE, have an average outer dimension in the range of about 5 to 15 μm, and amount to not less than 1% by volume of the electrolyte membrane an insert members in combination. — and

4. A fuel cell component comprising:

an electrolyte membrane; and

a plurality of insert members disposed in the electrolyte membrane that provide resistance to creep in the electrolyte membrane that would otherwise result from a compression force applied substantially perpendicular to a surface of said electrolyte membrane, wherein:

the plurality of insert members comprising a fine leaf glass powder.

5. A fuel cell stack comprising:

first and second end plate assemblies;

a fuel cell assembly interposed between said first and second end plate assemblies and comprising fuel cell components each comprising an electrolyte membrane and a plurality of insert members disposed in the electrolyte membrane that provide resistance to creep in the electrolyte membrane that would otherwise result from a compression force applied substantially perpendicular to a surface of said electrolyte membrane and electrodes disposed on each side of said electrolyte membrane, said fuel cell components being laminated with a plurality of separators; and

a compression assembly that clamps said first and second end plate assemblies and said fuel cell assembly together to provide said compression force, wherein:

the insert members comprise a material made of a polymer compound whose structure of the main chain moiety is the same as that of a material of the electrolyte membrane, and said insert members are granular members.

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